

# **Horicon and Fox River**

## *National Wildlife Refuges*

### **Draft Comprehensive Conservation Plan and Environmental Assessment**

#### *Table of Contents*

<b>Chapter 1: Introduction and Background .....</b>	<b>1</b>
Introduction .....	1
The U.S. Fish and Wildlife Service .....	1
The National Wildlife Refuge System .....	1
The Great Lakes Basin Ecosystem .....	2
Horicon Marsh .....	3
Horicon National Wildlife Refuge .....	3
Fox River National Wildlife Refuge .....	3
Refuge Purposes .....	6
Refuge Visions .....	6
Horicon National Wildlife Refuge .....	6
Fox River National Wildlife Refuge .....	6
Purpose and Need for Plan .....	6
History and Establishment .....	7
Horicon National Wildlife Refuge .....	7
Fox River National Wildlife Refuge .....	7
Legal Context .....	9
<b>Chapter 2: The Planning Process .....</b>	<b>10</b>
Internal Agency Scoping .....	10
Open Houses .....	10
Focus Group Meeting .....	11
Summary of Issues, Concerns and Opportunities .....	11
Horicon National Wildlife Refuge .....	11
Habitat Management .....	11
Wildlife Management .....	12
Visitor Services .....	12
State Highway 49 Issues .....	12
Cultural Resources .....	12
Visibility of Horicon NWR as a National Resource .....	12
Fox River National Wildlife Refuge .....	13
Wildlife Management .....	13
Habitat Management .....	13
Visitor Services .....	13
Cultural Resources .....	13
Administration and Logistics .....	13
Preparation, Publishing, Finalization and Implementation of the CCP .....	14
<b>Chapter 3: Refuge Environment .....</b>	<b>15</b>
Horicon National Wildlife Refuge .....	15

---

Introduction .....	15
Climate .....	16
Geology and Glaciation .....	18
Soils .....	19
Surface Hydrology .....	20
Wilderness Review .....	22
Archeological and Cultural Values .....	22
Social and Economic Context .....	23
Natural Resources .....	28
Habitats .....	28
Wildlife .....	28
Migratory Bird Conservation Initiatives .....	32
Wildlife Species of Management Concern .....	32
Horicon NWR Current Refuge Programs: Where We Are Today .....	32
Habitat Restoration .....	33
Habitat Restoration on the Refuge .....	33
Habitat Management .....	34
Managing Water Impoundments and Moist Soil Units .....	34
Mowing on Grasslands and Wet Meadows .....	36
Haying on Grasslands .....	37
Prescribed Fire on Uplands and Wetlands .....	37
Wildfire Preparedness .....	37
Controlling Invasive Plants .....	37
Habitat Monitoring .....	39
Aerial Infrared – GIS Technology .....	39
Grassland Surveys .....	39
Prescribed Burning .....	39
Wildlife Monitoring and Research .....	39
Surveys and Censuses .....	39
Studies and Investigations .....	41
Wildlife Management .....	42
Disease Monitoring and Control .....	42
Nest Structures .....	43
Predator and Exotic Wildlife Control .....	43
Coordination Activities .....	44
Interagency Coordination .....	44
Public Recreation, Environmental Education and Outreach .....	44
Hunting .....	46
Fishing .....	46
Wildlife Observation .....	47
Wildlife Photography .....	47
Wildlife Interpretation .....	47
Environmental Education .....	47
Volunteer and Friends Contributions .....	47
Outreach .....	48
Archaeological and Cultural Resources .....	48

---

---

Law Enforcement .....	48
Fox River National Wildlife Refuge .....	48
Introduction .....	48
Climate .....	49
Topography and Soils .....	49
Surface Hydrology .....	49
Archeological and Cultural Values .....	49
Social and Economic Context .....	49
Natural Resources .....	53
Habitats .....	53
Wildlife .....	57
Fox River NWR Current Refuge Programs: Where We Are Today .....	58
Habitat Management .....	58
Habitat Restoration .....	58
Wetland Restoration .....	58
Dry Prairie Restoration .....	58
Oak Savanna Restoration .....	59
Water Level Management .....	59
Moist Soil Management .....	60
Prescribed Fire .....	60
Haying .....	61
Controlling Invasive Plants .....	61
Vegetation Surveys .....	61
Vegetation and Habitat Surveys .....	61
Wildlife Management .....	61
Wildlife Surveys and Censuses .....	61
Nest Structures .....	65
Pest, Predator, and Exotic Animal Control .....	66
Coordination Activities .....	66
Interagency Coordination .....	66
Partners, Volunteers and Cooperating Organizations .....	66
Public Recreation, Environmental Education and Outreach .....	66
Deer Hunting .....	67
Law Enforcement .....	67
<b>Chapter 4: Refuge Management .....</b>	<b>68</b>
Horicon National Wildlife Refuge .....	68
Future Management Direction: Tomorrow's Vision .....	68
Refuge Vision .....	68
Goals, Objectives and Strategies .....	68
Fox River National Wildlife Refuge .....	79
Future Management Direction: Tomorrow's Vision .....	79
A Vision for Fox River National Wildlife Refuge .....	79
Goals, Objectives and Strategies .....	80

---

---

<b>Chapter 5: Plan Implementation .....</b>	<b>88</b>
New and Existing Projects .....	88
Horicon Refuge Operating Needs Projects .....	88
Fox River Refuge Operating Needs Projects .....	91
Future Staffing Requirements .....	92
Partnership Opportunities .....	92
Step-down Management Plans .....	92
Archeological and Cultural Values .....	92
Monitoring and Evaluation .....	94
<b>Appendix A: Draft Environmental Assessment .....</b>	<b>97</b>
<b>Appendix B: Glossary .....</b>	<b>163</b>
<b>Appendix C: Species List .....</b>	<b>169</b>
<b>Appendix D: Draft Compatibility Determinations .....</b>	<b>187</b>
<b>Appendix E: Compliance Requirements .....</b>	<b>223</b>
<b>Appendix F: Priority Refuge Operational and Maintenance Needs .....</b>	<b>229</b>
<b>Appendix G: Wildlife Species of Management Concern, Horicon NWR .....</b>	<b>231</b>
<b>Appendix H: Mailing List .....</b>	<b>241</b>
<b>Appendix I: List of Preparers .....</b>	<b>245</b>
<b>Appendix J: Bibliography and References Cited .....</b>	<b>249</b>

# **Horicon and Fox River**

## *National Wildlife Refuges*

### **Draft Comprehensive Conservation Plan and Environmental Assessment**

#### *List of Tables*

Table 1: Watershed Characteristics, Horicon Marsh, Horicon NWR .....	22
Table 2: Socioeconomic Characteristics Dodge and Fond du Lac Counties, Wisconsin .....	24
Table 3: Area of Land by Land-Use Class For Dodge and Fond du Lac Counties (thousands of acres) .....	26
Table 4: Dodge County Employment and Industry Data .....	26
Table 5: Fond du Lac County Employment and Industry Data .....	27
Table 6: 1995 Recreation-related Expenditures (1995 \$ in thousands) of Visitors to Horicon NWR .....	27
Table 7: Mississippi Valley Canada Goose Population Estimates (1948-1990) .....	28
Table 8: Furbearer Trapping Totals, 2000-2005, Horicon NWR .....	44
Table 9: Socioeconomic Characteristics, Marquette County, Wisconsin .....	52
Table 10: Marquette County Employment and Industry Data .....	53
Table 11: Summary of Spring 2004 Waterbird Surveys, Fox River NWR .....	62
Table 12: Marsh Birds Detected Per Point, Fox River NWR .....	62
Table 13: Ten Most Common Bird Species Documented on Fox River NWR, Summer 2003 .....	63
Table 14: Bird Counts by Habitat Type, Fox River NWR .....	63
Table 15: Frog and Toad Point Count Surveys, Fox River NWR .....	63
Table 16: Sandhill Crane Survey Results, 1994-2005, Fox River NWR .....	64
Table 17: Long Lake Fish Population Survey, 2004, Fox River NWR .....	64
Table 18: Fox River and Backwaters Fish Population Survey, 2004, Fox River NWR .....	65
Table 19: Muir Creek Fish Population Survey, 2004, Fox River NWR .....	65
Table 20: Additional Staffing Required to Fully Implement the CCP by 2021, Horicon NWR .....	92
Table 21: Step-down Management Plan Schedule, Horicon NWR .....	94
Table 22: Step-down Management Plan Schedule, Fox River NWR .....	95

# **Horicon and Fox River**

## *National Wildlife Refuges*

### **Draft Comprehensive Conservation Plan and Environmental Assessment**

#### *List of Figures*

Figure 1:	Location of Horicon NWR, Dodge and Fond Du Lac Counties, Wisconsin .....	4
Figure 2:	Location of Fox River NWR, Marquette County, Wisconsin .....	5
Figure 3:	Historic Vegetation of the Horicon Marsh (1850s) .....	8
Figure 4:	Southeast Wisconsin and Location of Horicon NWR .....	16
Figure 5:	Conservation Lands in Southeastern Wisconsin, Horicon NWR .....	17
Figure 6:	Location of Rock River Watershed, Horicon NWR .....	21
Figure 7:	Current Landcover of Horicon NWR (2006 Classification) .....	29
Figure 8:	Impoundments, Horicon NWR .....	35
Figure 9:	Existing Visitor Facilities, Horicon NWR .....	45
Figure 10:	Current Land Cover, Fox River NWR .....	50
Figure 11:	Historic Vegetation of the Fox River NWR .....	51
Figure 12:	Future Habitat Conditions of Horicon NWR .....	74
Figure 13:	Proposed Visitor Facilities, Horicon NWR .....	77
Figure 14:	Future Vegetation Cover, Fox River NWR .....	82
Figure 15:	Current and Proposed Visitor Facilities, Fox River National Wildlife Refuge .....	86
Figure 16:	Current Staffing Chart, Horicon NWR .....	93